A Critical Look at

Health Research in Nova Scotia

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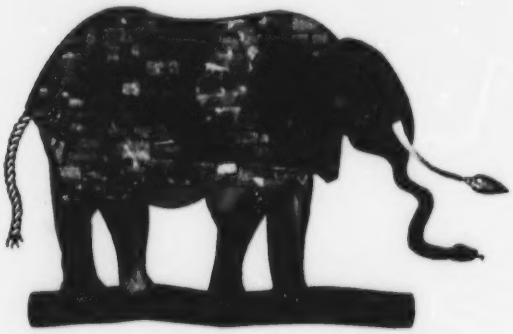
Abbreviations Used in the Text

AHRIS	Automated Health Research Information System
CHSRF	Canadian Health Services Research Foundation
CIAR	Canadian Institute for Advanced Research
CIHR	Canadian Institutes of Health Research
MRC	Medical Research Council
NHRDP	National Health Research and Development Program
NSERC	Natural Sciences and Engineering Research Council
NSHRF	Nova Scotia Health Research Foundation
SSHRC	Social Sciences and Humanities Research Council

Introduction



The Nova Scotia health research community is composed of multiple sectors, disciplines, funders and research centres. Just as the six blind men of India knew only one piece of the elephant, members of the research community are familiar with only a part of the overall research scene. This report was commissioned by the Nova Scotia Health Research Foundation to provide a common, broad overview of health research for the new Board of Directors. The Foundation, created in January 2000, is the first health research organization in Nova Scotia funded by the provincial government. The goal of the Foundation is to assist, collaborate with, and fund individuals and organizations conducting health research in the province.

This report presents both statistical and interview data to provide an indication of the current status for the Foundation's six objectives. These data are intended to help the Board and staff identify priorities and measure progress into the future. They identify areas where research is strong and other areas where it is relatively weak. They provide insight into the issues and challenges the health research community faces.

While this report is inwardly focused, the changing national environment for health research bears some examination. Consider a few national trends that require a rethinking of health research in the province:

- After years of cutbacks, the federal government is nearly doubling its investment in health sciences research, with commitments for significant annual increases into the foreseeable future.

- The creation of the Canadian Institutes of Health Research, a family of virtual institutes for organizing and funding health research, brings together a number of national funding agencies with the aim of coordinating, integrating, and aligning the health and research agendas in Canada. With this integration comes an increased emphasis on multidisciplinary, collaborative research.

- The metamorphosis of the Medical Research Council into the Canadian Institutes of Health Research also signifies a very deliberate decision to embark on research across a much broader spectrum of disciplines than in the past, requiring a national effort to build up health research in areas that were previously underdeveloped, such as nursing, the social sciences

and humanities, health services and policy, health economics and biostatistics.

- The federal government is infusing $900 million into research over the next five years to create 2000 new Canada Research Chairs in universities across the country. These chairs will be distributed according to each university's history of obtaining national research funding.

These national trends provide the context for understanding the NSHRF's objectives and the information presented in this report. The report draws primarily on key informant interviews and on the proposals reviewed by the NSHRF in 2000. Whenever available, other reliable sources were consulted and credited.

The report is organized according to the six objectives of the NSHRF:

1. to build and sustain a full range of health research in Nova Scotia
2. to foster health research as a foundation of health care, health education and health policy in Nova Scotia
3. to create and maintain a vibrant environment for research in the training of health professionals and health research investigators
4. to foster partnerships in health research among disciplines and across institutions
5. to support research that has the potential to increase economic activity in Nova Scotia
6. to support research that addresses health issues of importance to Nova Scotians

These six objectives were established by the interim Board of Directors that conducted the business of the Foundation until a permanent Board was appointed. This three-person interim body consisted of deputy ministers of the departments of Health and Community Services, and the Executive Director of the Nova Scotia Council on Higher Education.

The text for each objective touches on a) its significance with reference to national trends, b) perceptions of current status, c) indicators, and d) definitions, methods and caveats affecting interpretation of the data. Not surprisingly, the findings in each section are somewhat negative. The objectives of the Foundation are based on recent thinking in health research, and Nova Scotia, like the rest of the country, has much catching up to do. Tracking indicators over time will present a more positive picture of progress on each of the six objectives.

The indicators included in each section provide a measure of the current status and a baseline for monitoring change. The criteria used for selecting indicators were that they be a) relevant, b) readily available, and c) collected regularly to allow for tracking into the future. As a first attempt to provide such a broad overview of health research, the data available were clearly limited. Over time, as data collection systems in universities, funding agencies and the NSHRF become more developed and accessible, additional indicators will provide a far clearer picture for planning and decision making. *A Word on Indicators and Monitoring Systems,* in the appendix, describes considerations for selecting indicators and setting up a monitoring system.

The final section, *Key Issues and Recommendations*, summarizes the report and provides

recommendations and suggestions for the Foundation.

This document is not intended as a comprehensive review of health research in the province but rather as a tool for stimulating reflection, discussion and debate about strategies for achieving the objectives of the Foundation.

Methods

The information included in this report was obtained using a variety of sources and methods. Quantitative data were obtained from the NSHRF, Dalhousie Research Services, and national funding agencies such as the Canadian Institutes of Health Research (CIHR) and the Social Sciences and Humanities Research Council (SSHRC). The methods and definitions used for coding the NSHRF proposals are described in the text. Qualitative data were obtained through a series of key informant interviews.

Key informants were selected in a three-stage process:

- NSHRF staff and Merit Review Committee members were invited to nominate people to be interviewed, resulting in a long list of candidates.
- From this list, a small sample was selected that provided maximum diversity.
- Additional names were then selected over the course of the interviews to seek confirming/dissenting views and explanations for emerging themes.

The list of key informants is included as appendix D. It includes health charities, national funders, research centres, public and research administrators, and researchers from various disciplines and universities.

The method used to conduct the interviews is convergent interviewing[1], a technique that combines some of the key advantages of both unstructured and structured interviews. Convergent interviewing leaves much of the content unstructured so that it can be determined by the people being interviewed. The process, however, is tightly structured in that the information is analysed systematically after each interview to guide further sampling, data collection, and interpretation.

One single broad question was asked, and respondents were encouraged to speak as long as they wanted in response:

Tell me about health research in Nova Scotia - Strengths? Weaknesses? Opportunities? Threats?

Specific questions were asked only after respondents had nothing more to say in response to the initial question. These more specific questions were designed to probe for confirming and dissenting views and to seek explanations for themes that emerged in previous interviews. In this way, respondents were able to participate in data interpretation.

Brief, hand-written notes were taken during each interview. Immediately after each interview these notes were augmented, transcribed, and analyzed by the interviewer in the context of previous interviews. The process resulted in 13 completed face-to-face interviews that ranged

from 45 minutes to two hours.

One
Breadth and Diversity of Health Research

Objective 1:
To build and sustain a full range of health research in Nova Scotia

According to the 1998 Act to Establish the Nova Scotia Health Research Foundation, the objects of the act are to assist health services research, health outcomes research, health policy research and medical research. These four categories were based on the four research themes that cut across all institutes of the Canadian Institutes of Health Research.[2]

A need for increased research on health as distinct from disease came to the fore in the early 1990s with the publications **The Determinants of Health**[3] and **Why Are Some People Healthy and Others Not?** by the Canadian Institute for Advanced Research (CIAR). In 1994, the federal, provincial and territorial ministers of health officially endorsed a report entitled *Strategies for Population Health: Investing in the Health of Canadians.*[4] The report summarized what was known about the broad determinants of health and called for increased research on the factors that determine health and the impact of interventions and programs to address these factors.

Key Issue

The province lacks a critical mass of expertise in non-medical health research, health services, policy research and research involving the social sciences.

Indicators

NSHRF Proposals:

68% Medical research
13% Health outcomes research
12% Health services research
7% Health policy research

95% Disease research (understanding, care, or cure)
5% Health research (wellness, prevention, promotion)

88% Quantitative methods only

Developing a balance between health and disease research is also a priority for the CIHR. According to the final report of CIHR's Interim Governing Council, *Where Health Research Meets the Future*,[5] health research is concerned with understanding and creating well-being and quality of life, and includes health promotion and disease prevention. It is concerned with furthering knowledge of ways to create healthier populations. Disease research is concerned with

the understanding, care, and cure of illness and disability.

There is also an increased interest at the national level in encouraging more qualitative research in health. A position paper prepared for the Social Sciences and Humanities Research Council provides a strong argument for supporting qualitative as well as quantitative health research. According to the report:

> *Qualitative method is indispensable for the study of those aspects of health care which depend upon the social interactions between individuals or groups. Its contribution is made primarily in the study of two important aspects of health care: a) how patients and health care workers interpret their experience of health care and the significance which this has for the way in which the health care system functions and b) the cultural, historical and political circumstances which influence the nature of health care and its delivery.*[6]

Perceptions of Current Status

There is no question that Nova Scotia's research strength is in the basic or fundamental sciences. Basic scientists from Dalhousie's Faculty of Medicine are successful at accessing funding through the CIHR and some of these are considered world-class researchers. Overall, they are considered to be equal in calibre to researchers in mid-sized universities with similar resources.

In addition to fundamental research, the Faculty of Medicine and the affiliated teaching hospitals have a significant program of clinical research. While this area has grown rapidly in recent years, much of the growth has been through contract research and clinical trials. Clinical researchers from Nova Scotia are not yet considered very successful in accessing national peer-reviewed research dollars. The greatest obstacle is that most clinical researchers are active physicians with little time for research. Even so, a great deal of clinical research is carried out in this province, and the Queen Elizabeth II Health Sciences Centre has made clinical outcome research a priority.

Although these two areas of research account for by far the majority of health research in the province, bio-medical research is still considered to be somewhat fragile, with only a small number of researchers in each area of expertise and few people with dedicated research time.

In addition to bio-medical research, there are very small but growing bodies of research in population health and health promotion. Two areas in which Nova Scotia is believed to have a full range of research according to the four cross-cutting themes of the CIHR are cardiovascular and brain research. Table 1 lists the specific areas of health research strength and weakness.

Currently there is strong support and funding available nationally for research into the non-medical aspects of health. Unfortunately, Nova Scotia is not well placed to take advantage of these new opportunities as we have comparatively little research strength in these areas. Research

in women's health and health promotion are priorities for Dalhousie's Faculty of Health Professions. The Atlantic Health Promotion Research Centre and the Maritime Centre of Excellence in Women's Health are two examples of concerted efforts to build non-medical health research capacity. Despite these efforts, there is still a need for further efforts to encourage more faculty to engage in research.

Table 1: Perceptions of health research strengths and weaknesses

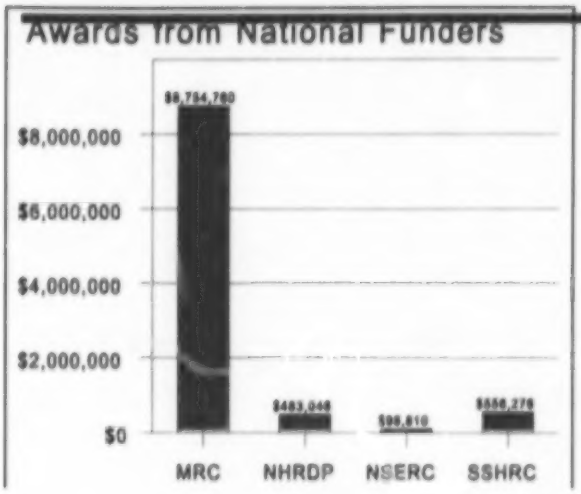
Research Strengths	Areas of Recent Growth	Research Weaknesses
Cardiovascular Genetics Immunology Neuroscience Transplantation	Bio-ethics Brain Cancer Clinical outcomes Drug utilization Health promotion Population health	Social and behavioural sciences Family medicine

Health research in the behavioural and other social sciences is also considered to be underdeveloped in the province, as it is across the country. Traditionally, the province has not been very successful in accessing SSHRC funding. Social scientists explain that the social sciences have never had either the recognition or the funding available for medical research. For this reason, success rates nationally for SSHRC funding have been low, and many researchers feel that it isn't worth applying. As a result, most social science research in Nova Scotia is done by single researchers for small amounts of funding available locally ($2000-$5000).

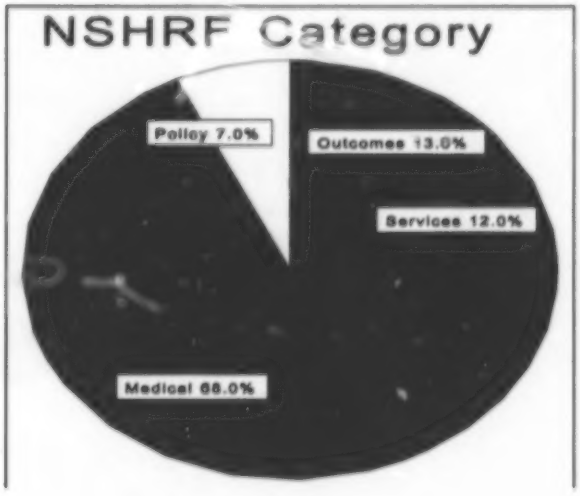
While much social science research addresses the social determinants of health to some extent, most social scientists do not frame their research as health research. This is true in Nova Scotia and in the country as a whole. Research into the social aspects of health is still in its infancy, and social scientists find that their research never quite fits the funding applications, review criteria, and ethics guidelines designed for conventional health research. Convincing the medical community and the public about the value of their research is a constant battle.

Explanations for Nova Scotia's weakness in non-medical health research include the following:

- Non-medical health research is neither understood nor valued.
- It is disadvantaged by the comparative strength of the far more established medical research community that determines funding and review criteria.
- There is no critical mass of high-calibre researchers in this area, therefore, few proposals are submitted and many are of poor quality.



community, and policy research.



- It is far more expensive than laboratory research, often requiring large populations, multi-disciplinary research teams, and years before it can show conclusive results.

Two somewhat opposing perspectives emerged about how best to build a full range of health research, in view of NSHRF's limited funds:

Fund research that fills gaps: Identify priority gaps in our current range of research, and hold targeted competitions designed specifically to encourage research in those areas. Gaps that were seen as priorities were behavioural,

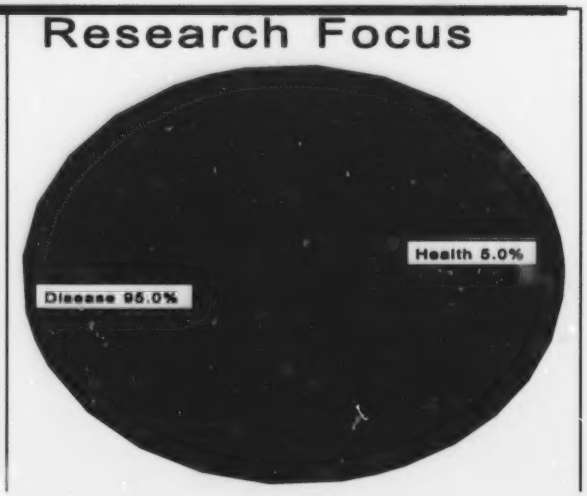
Fund excellence while building capacity: Maintain a fund that supports only the highest quality research, regardless of the type. At the same time, work at developing capacity to enable more non-medical researchers to attain this level of quality.

Indicators

The MRC, NHRDP, NSERC, and SSHRC are public, national peer-reviewed research funding bodies that serve as a standard for research excellence in Canada. Figure 1 shows the average annual awards to Nova Scotia for health research from each of these agencies from 1997-2000. The amount awarded for medical research (MRC) is twenty times the amounts awarded for either social science (SSHRC) or non-medical health (NHRDP) research.

Proposals submitted to the NSHRF in 2000 also provide an indication of the relative strength of various types of health research in the province. Figure 2 shows the distribution of proposals by NSHRF category: health policy research (7%), health services research (12%), health outcomes research (13%), and medical research (68%).

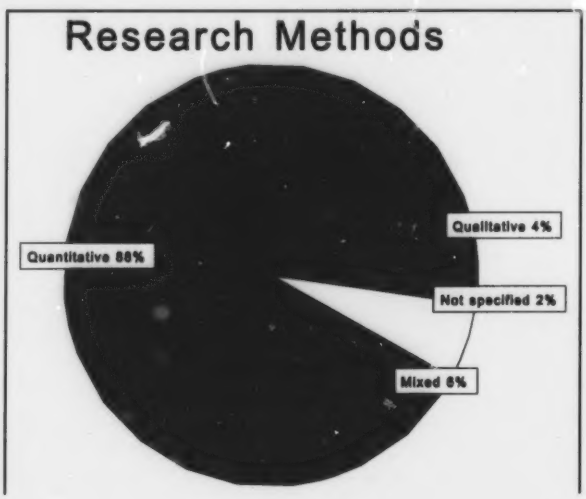
Only 5% of proposals focused on health as distinct from illness research (Figure 3). Figure 4 illustrates the relative distribution of research methods across the proposals: 88% quantitative methods, 4% qualitative methods, and 6% a combination of methods.



Methods, Definitions and Caveats

NSHRF Research Category:

All funding applications asked candidates to rank whichever of the four categories (health services, health outcomes, health public policy, medical) applied to their proposal. For the purpose of this report, proposals were assigned to the category they listed as most relevant unless the research did not fit the definition for the category, in which case they were re-classified to the definition that best fit. This occurred in 13 cases. The categories are described in the Act as follows:



Health Services Research: Research into the efficiency and effectiveness of the management, organization, and delivery of health services.

Health Outcomes Research: Research into changes in the health status of populations due to the implementation of health program or services.

Health Policy Research: Research into the impact of social factors, allocation of resources, legal and ethical issues and the administration, organization, and financing of health care.

Medical Research: Includes basic scientific and biomedical research as well as clinical and epidemiological investigations

Health Research:

All proposals were assessed as to whether they described research into health or disease, according to the following definitions adapted from the CIHR:

Health research is concerned with understanding and creating well-being and quality of life, and includes health promotion and disease prevention. It is concerned with

furthering knowledge of ways to create healthier populations.

Disease research is concerned with the understanding, care, or cure of illness and disability.

Research Methods:
All proposals were classified as quantitative, qualitative, or mixed based on their proposed data-collection methods. Those classified as qualitative proposed to use focus groups or interviews; however, they did not state and define a qualitative research perspective (e.g., grounded theory, phenomenology, ethnography, etc.). Two proposals did not contain sufficient information to determine whether research methods were qualitative or quantitative.

Caution should be exercised in interpreting the data presented in this section. While comparisons of health research funding from the various national agencies illustrate the strong dominance of medical research, it must be kept in mind that there are many additional sources of medical research funding including an average of over $13 million a year from the pharmaceutical industry[7] and close to $2 million from health charities.

Neither do indicators based on the NSHRF proposals represent all health research in Nova Scotia, as not all researchers put in proposals. However, informants' comments suggest that researchers less likely to submit proposals exist everywhere on the health research spectrum. Researchers in the basic sciences who are currently well funded, researchers in the social sciences who do not frame their work as health research, and community health researchers who do not feel their research fits any of the four categories were all reported not to have applied to the Foundation.

And finally, while the data in this section may suggest that no social sciences research in health takes place in Nova Scotia, this is not the case. What is true is that social science research is far less recognized and that there is far less of it than there is medical research. Table 2 lists health research projects funded through SSHRC from 1995 to 2000. This list illustrates the type of health research possible in the social sciences and in the smaller universities around the province.

Table 2: SSHRC Health Research Projects 1996-2000

Mount Saint Vincent University
Psychiatry and masculinity
Work and eldercare: The contribution of elderly parents to their employed children
Building a bisexual discourse: A narrative analysis
Disclosure in HIV-positive women: A theory of identity integration
Saint Mary's University
The development of attention in children from normative and clinical samples
The fertility and earnings of immigrant wives in Canada: A study of patterns and change
St. Francis Xavier University
Literacy and health in rural Nova Scotia: Making the connections
University College of Cape Breton
The language of distress: Medical and Italian-Canadian conceptions of nerves
Dalhousie University
An investigation of social-situational influences on university students' customary drinking behaviour
Mother-child talk about familiar and unfamiliar words/objects/actions
Catastrophizing and pain: Attention, pain behaviour and coping
Social integration and illness/disability: Testing of the relationship-issues profile
The therapeutic value of gardening in the daily life of terminally ill patients
Influences on individual differences in reaction to pain in infants and children
Unhealthy weight-regulation practices, body image and self-esteem among young adolescents: The effectiveness of a psycho-social school-based model
An investigation of the motivations underlying undergraduate's alcohol consumption behaviour
Language learning in children with Down syndrome: The impact of linguistic context
Social influences on early development
Impact of Swiss Air Flight 111 on volunteer responders, spouses, and adjacent communities
Catastrophizing and pain: The social determinants of exaggerated pain expression
Women, work and social policy in 20th-century Halifax
Adolescents and health-related services: A comparison of approaches

Distress and help-seeking in adolescent boys and girls *...continued*

Table 2: SSHRC Health Research Projects 1996-2000 *(Dalhousie, continued)*

Bioethics and health law

Supportive cancer care

The relation between defence mechanisms and health outcomes

The social determinants of women's postmenopausal health

Integrating developmental, evolutionary, and molecular biology: On the significance of the homeobox genes

Rethinking disability: The inadequacies of the disability-adjusted life year

Coping strategies in food security

Crossing boundaries: Health care workers in modern Canada

Exploring new forms of strategic management in health services: The contemporary experiences of home-care and long-term-care facilities in Atlantic Canada

Health inequalities in Nova Scotia: Magnitude, determinants and implications for health policy

Efficacy of an early intervention, community-based program for the management of disability associated with pain-related work injuries in rural communities

Two
Research Uptake

Objective 2:
To foster health research as a foundation of health care, health education and health policy in Nova Scotia

Key Issues

There are few bridges for interaction between health researchers and decision-makers in Nova Scotia.

Most health research is still carried out without decision-maker involvement.

Decision-makers rarely take advantage of the expertise in the health research community for informing policy decisions.

Nova Scotia is now recognized as an ideal "laboratory" for health research, but this advantage is not well exploited.

Indicator

82% NSHRF proposals with no decision-maker involvement

The recent focus on evidence-based decision-making in population health planning has increased attention on ways to promote the uptake of research results by decision-makers. Current thinking[8] suggests that sustained interaction between researchers and decision-makers is the key to the application of knowledge gained through research: Linkages between researchers and decision-makers must begin before a proposal is developed, to articulate relevant research questions, and must continue throughout the research process to maintain the interest of decision-makers and the relevance of the research. After completion of the research, results must be disseminated to decision-makers to make them aware of the research results and their significance.

To enhance the relevance and usefulness of research to society, both CHSRF and SSHRC require or strongly encourage that the investigative team include at least one decision-maker who is actively engaged in management or policy in the area under study and that research propsals include a dissemination plan aimed at decision-makers. According to SSHRC:

> *... the principal intention is that the* [decision-maker] *partner be an active member of the research team at every stage, from participation in the formulation of the research question, to using research results. The key benefit of partnership development – effective two-way communication – is to provide both researchers and partners with a clear picture of each other's needs. Researchers can benefit*

from understanding the issues confronting end-users of research results and can develop their research questions more effectively, and partners can better understand the implication of research results and more easily transform them into action.[9]

Perceptions of Current Status

Two recent and positive moves toward integrating researchers and policymakers are the integration of the tertiary care hospitals into the Capital District Health Authority and the overtures made by the Deputy Minister of Health to the research community. Historically, however, there has been little interaction between researchers and policymakers in Nova Scotia.

There is a perception among researchers that decision-makers know little about the research community and do not apply research results to provincial policy. At the same time, non-researchers feel that the research community does not understand how policy and legislation are developed. There is a belief on both sides that researchers could play an important role in research uptake by synthesizing research results to guide provincial decision-making and that this rarely, if ever, occurs.

The involvement of decision-makers in research teams is seen as more important in health services and policy research than in medical research. There is a perception that in clinical research, findings *are* implemented and as a result clinical research contributes to better health care in the province.

Nova Scotia is viewed as an ideal "laboratory" for policy-relevant health research for a number of reasons:

- Researchers have easy access to integrated data on over one million people through hospital administration data-bases, the Population Health Research Unit, and the Statistics Canada Regional Data Centre.
- Government decision-makers are accessible both geographically and because of a smaller bureaucracy.
- The tertiary-care research hospitals are part of the Capital District Health Authority.
- We have a single medical school and province-wide, tertiary-care hospital.
- Our population is stable. It is large enough to be statistically significant yet small enough to be manageable for research purposes.
- The Deputy Minister supports research and evidence-based decision-making.

Even so, the advantages are not exploited, and most research is carried out without decision-maker input. There are several obstacles to involvement of decision-makers on research teams:

- There are no regular points of contact between researchers and decision-makers.
- Establishing new relationships requires time and commitment. With the constant re-organization in the health care system, decision-makers are always changing, and building new relationships is an ongoing time commitment.
- There are few rewards or incentives for taking the time to work together.

- Cut-backs in the health system have increased workloads and limited the time decision-makers have for sitting on research teams.
- Policy decisions are based on many different sources of information, so decision-makers cannot justify the commitment of time and support to any one research study.
- Researchers are often looking at very narrowly focused questions that decision-makers do not perceive as immediately useful to them.

There is some interest in targeting NSHRF funding to research on specific policy questions of interest to the province, but there are also strong arguments against that approach:

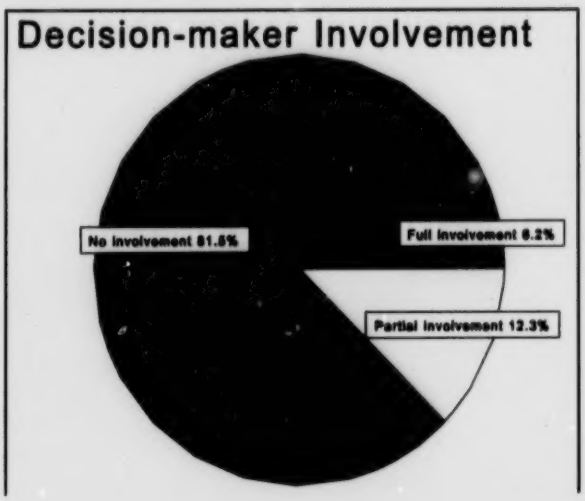
- Policy-makers have difficulty selecting and articulating policy-relevant research themes.
- Targeted research themes result in answers to policy questions in two to five years, long after decisions have been made.
- There are far too many policy questions. Research should be guided by our expertise not our questions. Decision-makers can find answers to many policy questions in the research literature, local research isn't usually necessary.

Indicator

The proposals reviewed by the NSHRF in 2000 provide a good indication of the involvement of decision-makers in health research in Nova Scotia. Figure 5 shows that only 6% of the operating grant proposals reviewed by the Foundation both involved a decision-maker on the research team and included a plan for disseminating results to decision-makers. An additional 12% showed some attempt at involving decision-makers by meeting only one of the two requirements.

Methods and Definitions

Only proposals for operating grants contained sufficient information to determine whether they involved decision-makers. Operating grant proposals were considered to involve decision-makers if they included a decision-maker as a co-applicant and described a mechanism for disseminating results to decision-makers. Decision-makers were defined as those either managing the health system or making policies for it.[16]



For clinical research proposals it was sometimes difficult to know whether or not the proposal included a clinical administrator in a decision-making position, as titles and positions within the hospitals were not identified. In these cases, if the text of the proposal made no mention of decision-makers'

involvement or dissemination, the proposal was assumed to not involve decision-makers.

Three
A Vibrant Environment for Research

Objective 3:
To create and maintain a vibrant environment for research in the training of health professionals and health research investigators.

The CIHR's description of the desired characteristics for the research institutes suggests that "a vibrant environment for research" might include the following:

Strength: *an existing basis of research excellence with clear potential for Canadian leadership*

Relevance: *to the health and health priorities of Canadians*

Balance: *on both health (well being, promotion and prevention) and disease (understanding, cure and care)*

Diversity: *room for all relevant perspectives in health*

Capacity and opportunity for the future: *a demonstrated potential to expand the research community in the face of emerging health issues*

Partnerships: *a potential to build effective collaboration with relevant stakeholders in health (including communities, organizations, the public and private sectors) and with other areas in the health research community – and the commitment to make those partnerships flourish.*[11]

Key Issues

The health research environment is less than vibrant due to four closely related challenges:

- No critical mass of researchers
- Difficulty attracting and retaining human resources
- Limited start-up funding
- Little intersectoral collaboration

Indicators

96% National, peer-reviewed health research awards to NS that go to Dalhousie University

95% NSHRF proposals from Dalhousie University and affiliated hospitals

33% CIHR success rate for proposals from Dalhousie University

73% Success rate for all health research proposals from Dalhousie University (all funders)

These criteria are very similar to the objectives of the NSHRF. As all but two of the above criteria are captured under other objectives, this section examines the strength and capacity for health research in Nova Scotia.

Perceptions of Current Status

The image of a "vibrant environment for research" that arises from the key informant interviews is one in which a critical mass of high calibre researchers is working in close collaboration and with appropriate supports. Based on this definition, it is probably safe to say that if such an environment exists in Nova Scotia, it is only within the Faculty of Medicine. Expertise in other faculties and institutions is described as "one-person deep" and providing little opportunity for critical interaction among researchers. This is especially true for health researchers outside of Halifax who are even more sparsely distributed and isolated from the support and challenge of a critical mass of peers.

There are at least four inter related challenges to creating a vibrant environment for health research in Nova Scotia:

- a small, dispersed research community
- difficulty attracting and retaining researchers
- limited funds to support the development of grant proposals
- little intersectoral collaboration (see Section 4)

It is widely acknowledged that the province has a number of very successful research "stars"; however, in most cases, these people are working in small research teams. Most other researchers are working alone or with one or two other people. There are few people with expertise in any one content area. Due to very limited staff and resources, these very small research teams have limited capacity for interacting with other sectors. There is a strong belief in the research community that researchers cannot thrive or carry out excellent research without continuous challenge from peers with different perspectives and areas of expertise. This division of the research community into small and often competing units is seen by some as the greatest challenge for health research in Nova Scotia, and there is some concern that it will further reduce the ability of researchers to access CIHR funding under the new integrated approach to health research.

A related and widespread concern is the difficulty of attracting and retaining researchers. Established researchers are reluctant to relocate to Nova Scotia due to the lower salaries and prestige, less stimulating research environment, and limited facilities and support personnel. The province is seen as a training ground for new researchers, who if successful then leave for larger centres. The Canada Research Chairs Program will make competition for top researchers even fiercer, as larger universities put together attractive packages to fill hundreds of health research chairs in Ontario, Alberta, and Quebec. There is a fear that not only will Dalhousie be unable to attract researchers to fill its health research chairs, but that it will also lose its best researchers to larger centres.

A third obstacle to a vibrant research environment is that until the advent of the NSHRF there has been no provincial money to help researchers develop grant proposals or to match funds awarded nationally. Proposals to national funders require substantial groundwork. Without funding to support the development of proposals for large research projects, many researchers have been limited to small, very low-cost research. Providing funds to help new researchers and

establish new programs of research is seen by some as the most important role for the NSHRF.

Informants feel that as a result of these challenges, much of the health research in Nova Scotia is of poor quality and most researchers do not have the capacity to compete nationally. They believe that a great deal of capacity building will be necessary before most health researchers will be able to put together a research proposal that can be funded nationally. To support these strong views, they cited evidence such as success rates with national funders and personal experience on peer-review panels. They provided numerous examples of proposals that are poorly written, have selective or haphazard literature reviews, provide no analytical framework, and propose inappropriate methods for data collection and analysis. They believe that this kind of proposal is the norm rather than the exception in Nova Scotia and has led to a very poor national reputation for Nova Scotia research.

These challenges to health research have not gone unnoticed or unaddressed. The Faculties of Medicine and Health Professions have taken a variety of measures to improve research proposals, including mentoring, internal peer review and proposal-writing workshops. The work of Cancer Care Nova Scotia is held up as a good example of a concerted effort to consolidate a number of disconnected researchers into a cohesive multi-sectoral group. Other efforts to develop more substantial research teams include a number of health research centres funded through federal grants. These centres support networking and collaboration between sectors, assist new researchers in getting established and provide opportunities for graduate students. While they have met with some success, most are not sustained after the initial grant ends. Less-than-competitive research has also benefitted from the MRC's Regional Partnership Program, a federal initiative to help build research capacity, that is now coming to an end. While some progress has been made, the health research community in the province is still considered to be fragile.

Indicators

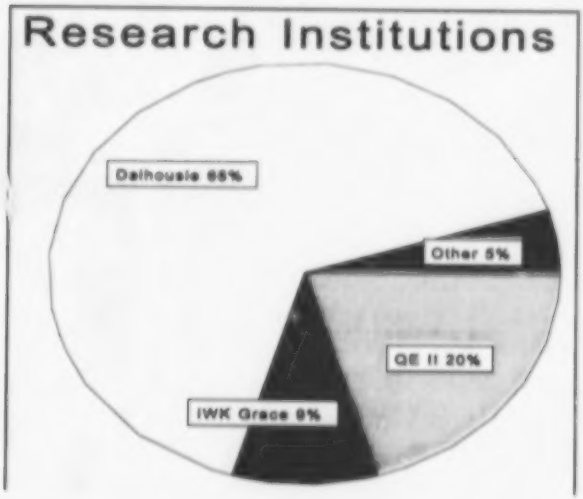
The number of institutions involved in health research and the amount of research taking place in each institution were estimated by consulting the following funding agencies: CIHR (MRC), NHRDP, CHSRF, NSERC, SSHRC, as well as looking at applications reviewed by the NSHRF in 2000.

By far, the bulk of peer-reviewed health research in Nova Scotia takes place at Dalhousie University and its affiliated teaching hospitals. The institutions funded for health research through major national peer-reviewed funding agencies over the last three years for which complete data were available (1997-1999) are listed in Table 3. This table shows the number of health-related projects funded for each institution and also shows all of the institutions that applied for funding through the NSHRF in 2000. Only four Nova Scotia institutions received funding for health-related research from these major national funders during the period in question. Ninety-six percent (96%) of these awards went to Dalhousie University.[12]

Table 3: Institutions funded for health research, 1997-1999 and Institutions that applied to the

NSHRF, 2000

	Health research grants & scholarships awarded						Applicants 2000
	MRC	NHRDP	CHSRF	NSERC	SSHRC	Total	NSHRF
Acadia University	-	-	-	-	-	0	3
Colchester Regional Hospital	-	-	-	-	-	0	1
Dalhousie University	157	8	1	2	16	184	77
IWK Health Centre	-	-	-	-	-	0	11
Mount St. Vincent University	-	2	-	-	3	5	0
QEII Health Sciences Centre	-	-	-	-	-	0	24
St Francis Xavier University	-	-	-	1	-	1	2
Saint Mary's University	-	-	-	-	2	2	0
NS Totals	157	10	1	3	21	192	118



Six institutions submitted proposals for the NSHRF 2000 competition. Ninety-five (95%) percent of these proposals were from Dalhousie University and its affiliated teaching hospitals (Figure 6).

Health research centres and institutes represent efforts to create a critical mass of researchers working together. Although a thorough search was not done, 22 health research centres were found in the province, and these are listed in Appendix C.

Success rates for health research proposals were obtained from the CIHR Electronic Information System, which tracks success rates and dollar values for all proposals reviewed. The three-year success rate (1997-1999) for new NS proposals to the MRC was 36.9%. All but two of these proposals were from Dalhousie University, and neither of these two was successful. The five-year success rate (1995-2000) for Dalhousie University with the CIHR/MRC was 33%. For comparison purposes, success rates for a number of other universities across the country are shown in Table 4.

NSHRF, 2000

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Colchester Regional Hospital	-	-	-	-	-		1
Dalhousie University	157	8	1	2	16		77
IWK Health Centre	-	-	-	-	-		11
Mount St. Vincent University	-	2	-	-	3		0
QEII Health Sciences Centre	-	-	-	-	-		24
St Francis Xavier University	-	-	-	1	-		2
Saint Mary's University	-	-	-	-	2		0
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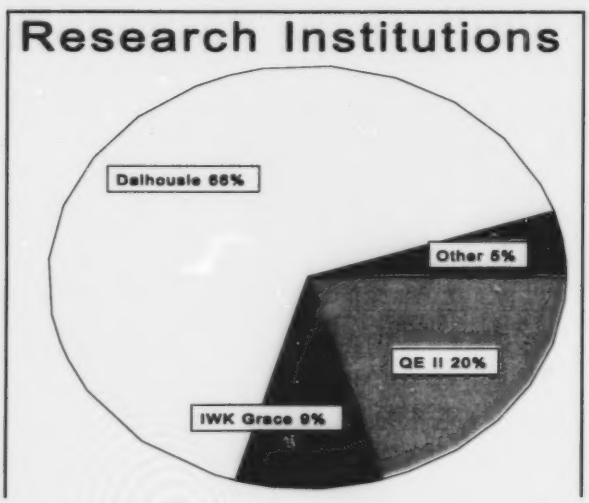

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Table 4: CIHR five-year success rates (1995-2000) for new applications, selected universities

Research Centres	# New applications	Success rate
Memorial University	194	38%
University of Alberta	1006	36%
University of Calgary	739	35%
University of Toronto	3871	34%
Dalhousie University	**538**	**33%**
McMaster University	807	33%
McGill University	2643	31%
University of Western Ontario	760	31%
University of Ottawa	841	29%
University of British Columbia	1585	29%
Université de Montreal	2118	28%
University of Saskatchewan	381	28%
Université Laval	1150	26%
University of Manitoba	888	26%

funded under open competition.

Dalhousie Research Services tracks success rates for grant proposals by faculty and department. The four-year success rate (1996-1999) for all proposals from the Faculties of Medicine, Dentistry, Health Professions, and the Department of Psychology was 73%.

Methods, Definitions and Caveats

Health-related research for NSERC and SSHRC projects was determined by each agency's internal data system. Both agencies' coding systems include health as a code for project area of application.

CIHR success rates for Dalhousie, Memorial, Saskatchewan and Manitoba universities include proposals funded through the Regional Partnerships Program. Since its inception in 1996, 23 Dalhousie proposals have been funded through this program, which was designed to build research capacity in the regions by supporting high-quality research that would not have been

Four
Partnerships and Collaboration in Research

Objective 4:
To foster partnerships in health research among disciplines and across institutions

The contribution of partnerships to research excellence is now widely acknowledged and is often required by funders. Working in partnership is a principle of the CIHR and seen as essential for the coordination, integration and alignment of the health and research agendas in Canada. Drawing communities of researchers into relationships with others who have complementary interests is believed to build critical mass in important areas of research and increase the exchange of knowledge among researchers and between researchers and the people who can put the findings to use.[13]

Perceptions of Current Status

The Population Health Research Unit, Heart Health Nova Scotia, and the Atlantic Health Promotion Research Centre are three recognized leaders in developing intersectoral research partnerships. Overall though, partnerships are still unusual in Nova Scotia and do not appear to be a high priority in the health research community. On the contrary, health research is described as fragmented, with little collaboration and noticeable hostility between sectors and individuals.

Key Issue

Health research is described as fragmented, with little communication and collaboration, and noticeable hostility between sectors and individuals.

Indicator

11% NSHRF proposals from research partnerships

Informants observed that even though the province is small, it has "no bridges" for developing working relationships between researchers in the basic and clinical sciences, between medical and social science researchers, between researchers in the Faculties of Medicine and Health Professions, between researchers in different universities, and between researchers and policymakers.

The research community is feeling pressure from provincial and federal governments as well as funding agencies to work more intersectorally, both across the province and Atlantic Canada wide. Researchers recognize that not doing so may diminish the province's ability to access public funding for research. While some see the value of partnership, more describe reasons why

partnerships are difficult:

- The development of partnerships requires a large time commitment.
- Small research units are expected to participate in many multi-sectoral initiatives. They do not have the resources to do so and often gain little in return.
- The possibilities for partnering with excellence in complementary fields are very limited within the province. Partnering with weaker researchers will reduce their chances of obtaining funding.
- The primary investigator model of research funding is inherently competitive and hierarchical and provides disincentives to collaboration.
- There is a risk of losing control and focus of the research.
- Funding opportunities do not generally provide sufficient time to develop research proposals collaboratively.
- There is no operational funding to support collaborative research groups.

There is a belief that universities have not provided support for intersectoral collaboration and that it is their role to do so. Some of the suggested ways they could support collaboration include:

- providing operational funding for intersectoral research networks and centres
- developing regional electronic research bulletin boards
- appointing faculty to intersectoral research institutes.

Indicator:

Only 11% of proposals reviewed by the NSHRF described research partnerships according to the definitions and criteria described below.

Methods, Definitions and Caveats

Only proposals for operating grants contained sufficient information to determine whether they were put forward by research partnerships. Proposals were considered to be partnership initiatives if they described a research partnership and included partners in the list of co-applicants or collaborators based on the SSHRC definition below:

> *Partnerships are composed of a researcher or group of researchers affiliated with a post-secondary educational institution – and an organization not affiliated with a post-secondary educational institution. The partner not affiliated with a post-secondary institution can be from the public, private or non-profit sector and must have an interest in, and a strong contribution to make to, a research project or activity.*[14]

It was clear from the proposals that this definition does not reflect the understanding of partnerships in the Nova Scotia research community, as virtually every proposal claimed it was a partnership initiative, although the partners were usually from different disciplines within the

Faculty of Medicine, or between researchers from the Faculty and an affiliated teaching hospital. While these efforts are commendable, they would not fit most definitions of partnerships and are more commonly defined as collaboration:

> *Collaboration is defined as an on-going, active and substantive working relationship between two or more researchers who are in the same or different disciplines and/or institutions, and who bring different perspectives to bear on major research projects requiring long-term funding.*[15]

Five
Research and Economic Activity

Objective 5:
To support research that has the potential to increase economic activity in Nova Scotia

Health research contributes over $35 million annually to the Nova Scotia economy. It does so by attracting external dollars that are spent on salaries and services within the province. Medical research is estimated to employ over 800 people in Halifax, and these are very well-paying jobs.

However, medical research can also contribute to economic activity in more direct ways:

- Industry uses published research results and employs graduates of research programs.
- Universities carry out contract research for industry.
- Patented and other protected intellectual property is licensed and start-up companies are formed.

Increasing commercialization of health research is a sub-objective or secondary role of the CIHR. In partnership with industry, the agency operates a number of programs aimed at increasing interaction between researchers and industry, and supporting researchers in commercializing the results of their research.[16]

Opportunities for Prosperity, the latest economic strategy for Nova Scotia (October 2000) identifies the "life sciences sector" as one of five areas of potential growth opportunity.

Perceptions of Current Status

Key Issue

The contribution of health research to the provincial economy is well recognized by those in the medical research community. They believe that the most significant contribution is the inflow of dollars for research and clinical trials and they are not very concerned with exploiting the economic potential of their research. However, the province now boasts a growing bio-medical research industry that contributes ever increasing amounts to the provincial economy. Four new bio-medical businesses were launched last year, and there are plans to develop a health research village to incubate spin-off business initiatives. There is more demand than ever before for researchers to make a strong business case for their research, and this is something they are generally not good at or interested in. Researchers will need support and encouragement to fully exploit the economic possibilities of their research.

Researchers are not naturally blessed with entrepreneurship. They need encouragement and assistance to put together large funding partnerships and fully exploit the economic potential of their research.

Indicators

$35 milllion
The estimated economic value of health research in Nova Scotia

16% NSHRF proposals with specific economic potential

There is a belief in the sector that with adequate support, health research could bring in far more dollars. We are experiencing a national climate of "big, innovative research", and there is more research funding than ever available for large health research projects. This is seen by some as a tremendous economic opportunity; however, others believe that most health researchers lack either the interest or the ability to put together the teams of researchers and funding partners required to access these big research dollars. They see many missed opportunities for leveraging small grants into much larger projects, either due to complacency or to the lack of funding for matching grants.

Indicators

Indicators for the economic impact of health research are the total dollar value of health research at Dalhousie University and the percentage of NSHRF proposals that describe a specific and direct economic impact of their project.

Dalhousie Research Services tracks research funding received through grants, contracts and clinical trials by faculty and department. The value of health research in Nova Scotia is estimated using figures from Dalhousie's Faculties of Medicine, Dentistry, Health Professions, and the Department of Psychology. The total value of research grants, contracts and clinical trials has grown from $23.8 million in 1996 to over $35 million in 1999.

Sixteen percent of all proposals reviewed by the NSHRF described a potential for specific economic impact on the province. The economic impacts they described included the potential

to:

- develop the bio-medical software industry
- attract new clinical trials and contract research
- result in new inventions and patents
- create markets for Nova Scotia's natural resources.

Methods Definitions and Caveats

NSHRF applications asked whether the project would contribute to economic development in the province and if so, how. Proposals were considered to contribute to economic development if they described a specific and direct economic impact of their project. Several proposals described the economic impact of reduced illness or disability on the province and the impact of spending research dollars in Nova Scotia. As these economic impacts could apply to all proposals, they were not counted as specific economic impacts.

The value of health research in the province was estimated using figures from Dalhousie University. While this indicator leaves out health research funding received by other universities, it captures the vast majority of health research in the province. Data on success rates and the value of health research were not available from other universities, which are only just beginning to develop systems to track research proposals.

Six
Research on Issues of Importance to Nova Scotians

Objective 6:
To support research that addresses health issues of importance to Nova Scotians

Traditionally, health research has been independent, that is, based on a researcher's curiosity. More recently, funding agencies tend to identify research priorities and target their funding to research in these priority areas. According to the CIHR,[17] the agency intends "to create a research environment in which health priorities of Canadians are more visible, and to subtly influence the research agenda in the country over the long-term to more closely reflect these priorities". The agency will engage both researchers and non-researchers (voluntary health organizations, governments and others) in identifying broad research priorities.

Key Issue

The extent to which research priorities should be guided by issues of importance to Nova Scotians is a contentious one in the research community.

Indicators

70% NSHRF proposals that did not address any of the top 10 health issues identified through Provincial Health Council consultations

5% NSHRF proposals for community-based research

Another way to ensure that research is of importance to the public is to engage the community in research to solve its own problems, a process known as community-based research:

> *Community-based research involves the community, working in partnership with researchers, to solve practical problems, assess needs, and evaluate programs and services. It is a planned, systematic process that asks questions, seeks solutions, and applies results in practical ways. Community-based research is increasingly important in health care (and in other human services) as communities are required to take greater ownership and responsibility in meeting community needs.*[18]

During the first year of operation of the NSHRF, community researchers and policy-makers expressed concern that the Foundation is not supporting community-based research.

Perceptions of Current Status

Supporting research on issues of importance to Nova Scotians is an issue of controversy within

the research community. In the medical community, there is a belief that all research is of importance to Nova Scotians because it eventually leads to better medical care. Outside this community some feel we have more information than we can use on illness and not nearly enough on preventing it. While there is much hope that the NSHRF will facilitate an intersectoral process to identify priorities and develop a strategic plan for health research in the province, there is disagreement on how priorities should be identified. Some believe that priorities are best identified by the research community based on current strengths and natural advantages; others believe research priorities should be identified by the public based on current policy issues.

Indicators

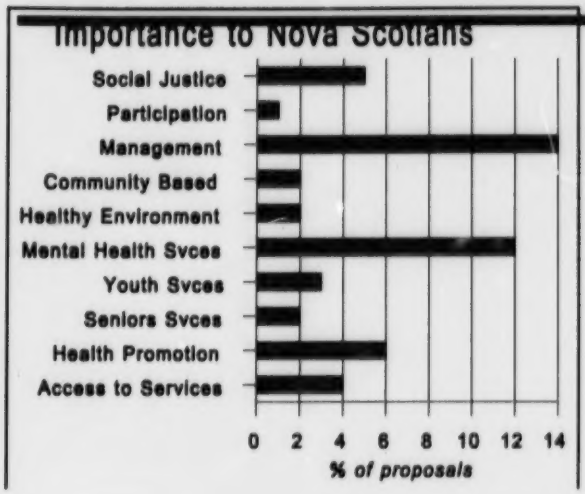
Only 5% of proposals reviewed by the NSHRF were for community-based research. Respondents suggested two reasons why there were so few community-based proposals: there was not enough time for proposal development, and community-based researchers did not feel that their research fell within the guidelines as reflected in the application form.

A recent public consultation by the Nova Scotia Provincial Health Council[19] identified seven major health issues of Nova Scotians. These seven issues when combined with Nova Scotia's Health Goals identified through an earlier consultation[20] provide an indication of the top 10 health issues of importance to Nova Scotians:

- Access to care
- Health promotion/disease prevention/education
- Clean environment
- Integrated services for seniors
- Coordinated services for youth
- Mental health services
- Community-based services and decision-making
- Wise and fair management of resources
- Participation of Nova Scotians in decisions affecting health
- Social justice

Nearly 70% of proposals reviewed by the NSHRF did not address any of these 10 issues. Figure 7 shows that only two of the issues, mental health services and management of resources, were addressed by a significant number of proposals (14 and 17, respectively).

Methods and Definitions



Only proposals for operating grants contained sufficient information to determine whether they were community-based. Proposals were considered to be community-based if two conditions were met: 1) the research was to take place in a community setting, and 2) the proposal included a community organization as applicant or co-applicant. Community organizations were defined as service clubs, health charities, band councils, hospital foundations, community non-profit organizations, municipal government departments and community health boards.

Proposals were considered to be addressing issues of importance to Nova Scotians if they addressed any of the top 10 health issues previously listed. These issues are based on the results of two broad consultations with Nova Scotians carried out by the Provincial Health Council. The first of these consultations was carried out in 1992 and resulted in the development of the Provincial Heath Goals, which were reaffirmed by the Government of Nova Scotia in 1999. A more recent public consultation by the Council identified seven major and recurrent themes expressed by Nova Scotians regarding their health. These themes were consistent across the three sources of information used in the study: workbooks, public meetings, and community health plans developed by community health boards across the province. The following definitions are based on information from the two documents:

Access to Care: Access to clinical and primary care services in both urban and rural areas, including family doctors, emergency services, and appropriate home and hospital care

Health Promotion/Disease Prevention/Education: Access to learning opportunities and the necessary services and facilities to maintain health and prevent illness, such as health clubs, gymnasiums, swimming pools, sports and other recreational facilities

Clean Environment: Clean air, water and soil, as well as safe places to live, work and play

Services for Seniors: Integrated services for seniors, including home care, home support services, long-term care, respite care and day programs

Services for Youth: Coordinated services to address issues such as teen pregnancy and hopelessness, including accessible recreational opportunities, enhanced programs in schools and better community resources such as addiction services

Mental Health Services: Concern about suicide, alcoholism and use of other substances as

a result of problems with mental health; recognition of the need for resources to deal with these issues when children are young

Community-Based Services and Decision-making: A need for services, access and decision-making to be community-based, such as local management of community health centres and more authority for community health boards

Management: Open, effective, efficient and accountable use of the people, programs, equipment and facilities that support health

Participation: Opportunities and support for all Nova Scotians to participate in making decisions about health and the health care system

Social Justice: Opportunity for all Nova Scotians to achieve health. Poverty, unemployment, racism, illiteracy, violence, rural isolation, and other issues make it more difficult for some people to be as healthy as others.

Key Issues and Recommendations

Key Issues Summary

The province lacks a critical mass of expertise in non-medical health research, health services and policy research, and research involving the social sciences.

There are few bridges for interaction between health researchers and decision-makers in Nova Scotia. Most health research is still carried out without decision-maker involvement.

Decision-makers rarely take advantage of the expertise in the health research community for informing policy decisions.

Nova Scotia is now recognized as an ideal "laboratory" for health research, but this advantage is not fully exploited.

The health research environment is less than vibrant due to little critical mass, difficulty attracting and retaining researchers, limited availability of start-up funding, and little intersectoral collaboration.

Health research is described as fragmented, with little communication and collaboration, and noticeable hostility between sectors and individuals.

Researchers are not naturally blessed with entrepreneurship. They need encouragement and assistance to put together large funding partnerships and fully exploit the economic potential of their research.

The seven key issues that arose from the current work are listed at the left. While these issues are based on interviews with only 13 people, they are corroborated to a certain extent by a series of indicators and provide a reasonable indication of the current state of health research in Nova Scotia.

In addition to describing the state of health research, key informants expressed a warm welcome for the NSHRF and shared a variety of expectations and suggestions for the Foundation.

The most consistent of these messages was for the Foundation to facilitate a process to develop a strategic plan for health research in the province. While informants may not have agreed on why such a process is necessary, they did agree on the need for a plan and that the Foundation should take the lead in its development.

For some people, the purpose of such an initiative would be to create a dialogue and collaboration between universities and research sectors. They see a need to bring all research stakeholders to the planning table: hospitals, health charities, research centres, health decision-makers, research administrators, the pharmaceutical industry, and researchers from different disciplines and universities.

The Foundation needs to act as a broker to bring all the research stakeholders to the table and to facilitate a dialogue so that they can begin to work together.

For others, the planning process would be a way to make some hard decisions about health research priorities and how these would be supported. These people believe that as a small province we cannot do well in every research area and that it makes more sense to build expertise and critical mass in priority areas.

Three Recommendations for NSHRF

1. Facilitate a collaborative planning process
2. Build capacity for research
3. Fund only highest quality research

If they just fund anything and everything, the money will be wasted.

As a province we haven't come together to identify our priorities and talk about how we can capitalize on our strengths, so that we get our fair share of CIHR dollars.

Additional issues informants feel need to be addressed in a strategic plan for health research are:

- attracting research chairs to the province
- building capacity for research in areas where we are weak
- supporting smaller universities in developing their research capacity
- building mechanisms for regular communication and collaboration between sectors

Another common message related to the Foundation's role in developing capacity for research in the province. While virtually every informant spoke of this, there were many different suggestions about how the Foundation might do it. Some of the ways they believe that research capacity can be increased include:

- increasing communication between disciplines
- providing salary support for strong researchers and core funding to research centres
- surrounding strong researchers with support personnel (graduate and post-doctoral students)
- recruiting strong researchers and building programs of research around them
- training, mentoring and providing assistance in proposal development
- creating networks of researchers who can contribute to research proposals
- targeting competitions to specific areas of research, and designing the publicity, application forms, and review teams accordingly.

One final strong message to the Foundation: in order to succeed, research excellence must be the highest priority. Some people expressed a concern that lower-quality research might be funded in response to political pressure or popular trends. Several informants spoke about the Foundation's role as a stepping stone to national and international funding. They provided examples of high standards giving rise to better research and low standards feeding mediocre research that wouldn't get funded nationally, thus creating dependency. They recommended a policy to fund researchers for a maximum of two years with an expectation that researchers graduate from the NSHRF to the CIHR, and they encouraged the Foundation to develop a tracking system to measure the success of their researchers in moving on to national funding.

Collaborative planning, capacity building, and research excellence: three sound messages to guide the NSHRF into the future. The Foundation is seen as a great resource for strengthening and expanding health research, and for creating a cohesive and vibrant environment for research. Although it is a small agency, it can have a big impact. The current national climate of increased funding for all types of health research is a golden opportunity for the province, one we cannot afford to waste. Those in the research community believe that the NSHRF is the force that can bring stakeholders together in a common cause to make the most of this opportunity.

Endnotes

Bibliography

Canadian Health Services Research Foundation. 1999. *Issues in Linkage and Exchange Between Researchers and Decision Makers.* CHSRF Resource Document, Ottawa.

Canadian Institutes of Health Research. 2000. *Where Health Research Meets The Future: The Final Report of the Interim Governing Council.* p 26.
Http://www.cihr.ca/about_cihr/interim_gc_report/final_report_english.pdf

Canadian Institutes of Health Research. 1999. *Partnerships and Collaboration Working Paper.*
Http://www.cihr.ca/about_cihr/interim_gc_report/finalenglishpc.pdf

Dick, B. 1998. *Convergent interviewing: A technique for qualitative data collection* [On-line].
Http://www.scu.edu.au/schools/gcm/ar/arp/iview.html

Federal Provincial and Territorial Ministers of Health. 1994. *Strategies for Population Health: Investing in the Health of Canadians.* Ottawa.

Grant, K.R. 1999. *Integrating the Social Sciences and Humanities in the Canadian Institutes for Health Research.* The Social Sciences and Humanities Research Council. Ottawa.
Http://www.sshrc.ca/english/programinfo/grant.pdf

Hollenberg, M.J. 2000. *Transforming the health sciences - A 21st century challenge.* ACMC-J. Wendell MacLeod Lecture. Whistler B.C.

Lomas, J. 2000. Using 'linkage and exchange' to move research into policy at a Canadian foundation. *Health Affairs* 19#3:236-240.

Lomas, J. 1997. *Improving the Research Dissemination and Uptake in the Health Sector: Beyond the Sound of One Hand Clapping.* Report prepared for the Advisory Committee on Health Services to the Federal/Provincial/Territorial Conference of Deputy Ministers. Ottawa.

Mustard, F.J., and J. Franck. 1991. *The Determinants of Health.* Canadian Institute for Advanced Research publication #4. Toronto.

NS Provincial Health Council. 2000. *Health for Nova Scotians.* Halifax.

Rx&D Canada's Research-Based Pharmaceutical Companies. 2000. *Nova Scotia Profile: The Pharmaceutical Industry in Nova Scotia.* Ottawa.
Http://www.canadapharma.org/en/about/industry/00factsheets/pfsns.pdf

Appendix A
A Word on Indicators and Monitoring

The initial intent of the work leading to this report was to provide a series of indicators that could be used for evaluating the work of the NSHRF over time. As the work proceeded, it evolved into the current broader report. However, the idea of a series of indicators remained as a subtext and bears further consideration. The information contained in this report will provide a basis for informed discussion and decisions about the information needs of the NSHRF.

Decisions about selecting indicators and developing a system for tracking them can have long-term repercussions and should be approached cautiously. How the information will be managed and used deserves careful consideration. The two big challenges inherent in developing such a system are: 1) creating a system that is useful, and 2) getting people to use it.

Considerations in developing a monitoring system include conceptual issues, staffing issues, data-collection issues, and technology issues. Some examples of each of these are listed below.

Conceptual Considerations

What is the purpose of the system?
Is it a tool for the staff and the Board to assess their own effectiveness and learn how they might improve, or is it a tool to monitor changes in the health research sector? Is it a tool for providing information to decision-makers in the Departments of Health and/or Finance? What kinds of decisions will be made as a result of the information gathered?

How will the information be used?
The information collected must be easily interpreted and focussed on key points. What kind of reports will be produced? For whom? By whom?

Who will provide the information?
Will the information for the system come from staff, universities, funders, applicants, or researchers?

How will the data be collected?
Will it require forms or surveys to be filled out by funding agencies, researchers, or universities?

Will indicators be credible to the ultimate users?
Indicators must be credible to those who use them. What is credible to a decision-maker may

not be credible to a researcher, a politician, or a community organization.

What indicators will be most useful?
Research on the use of indicators has shown that indicators handed down from on high have little influence in bringing about change. Indicators need to be meaningful to those who will act on the resulting information. The ultimate users need to be involved in choosing the indicators that are meaningful to them.

How many indicators?
A few carefully chosen indicators will be more meaningful and manageable than a large number of indicators covering every possibility.

Staffing Considerations
Training
Monitoring reliability of system
Quality-control checks
Responsibility for data collection, analysis and reports

Technical Considerations
Hardware, software and programming
Ease of entry
Ease of manipulating data to produce reports

Appendix B
NSHRF 2000 Proposals: Data Table

Indicators	#	Success rate	Reviewed		Awarded	
			#	% of total reviewed	#	% of total awards
Health services research	118	50%	14	12%	7	13%
Health outcomes research		47%	15	13%	7	13%
Health policy research		25%	8	7%	2	4%
Medical research		49%	80	68%	39	71%
Community-based research	81	25%	4	5%	1	3%
Health research	118	17%	6	5%	1	2%
Disease research		48%	112	95%	54	98%
Qualitative research	118	60%	5	4%	3	5%
Quantitative research		48%	104	88%	50	91%
Mixed methods		14%	7	6%	1	2%
Research that involves decision-makers	81	40%	5	6%	2	6%
Partial decision-maker involvement		20%	10	12%	2	6%
No decision-maker involvement		47%	66	81%	31	89%
Research partnerships	81	44%	9	11%	4	11%
Research with economic impact	118	42%	19	16%	8	15%
Research on issues of importance to NS	118	39%	36	31%	14	25%
Access to care	118	60%	5	4%	3	5%
Health promotion/disease prevention		14%	7	6%	1	2%
Clean environment		-	2	2%	0	0
Integrated services for seniors		-	2	2%	0	0
Coordinated services for youth		67%	3	3%	2	4%

Indicators	n	Success rate	Reviewed		Awarded	
						...continued
Mental health services		50%	14	12%	7	13%
Community-based services and decisions		-	2	2%	0	0
Wise and fair management of resources		47%	17	14%	8	15%
Participation of Nova Scotians		-	1	1%	0	0
Social justice		17%	6	5%	1	2%
Acadia University	118	33%	3	3%	1	2%
Colchester Regional Hospital		100%	1	1%	1	2%
Dalhousie University		48%	77	65%	37	67%
IWK Health Centre		46%	11	9%	5	9%
Queen Elizabeth II Health Sciences Centre		46%	24	20%	11	20%
St. Francis Xavier University		-	2	2%	0	0%
All proposals	118	47%	118	100%	55	100%

Appendix C
Health Research Centres and Institutes

Note: The information in this list was collected from a variety of sources, most notably the world wide web. It may not be up to date or complete.

Atlantic Centre of Research, Access and Support for Students with Disabilities
Director: Dr. David Leitch
Saint Mary's University
Halifax, NS B3H 3C3
(P) 902-420-5452
(F) 902-496-8122
Website: http://www.stmarys.ca/administration/studentservices/atlcentr/atlantic.html

Accessibility for persons with disabilities has long been a cornerstone of the philosophy of Saint Mary's University. For over 30 years, Saint Mary's has played a leadership role in ensuring that higher education is accessible. In 1985, the Atlantic Centre of Research became a reality. The Atlantic Centre is one of three centres of specialization in Canada supported by the Federal Government to enhance the full participation of citizens with disabilities in higher education. The Centre offers unique programs and individualized support, as well as a program of research.

Atlantic Health and Wellness Institute
Director: Dr. Lydia Makrides
6960 Mumford Road
Suite 14, West End Mall
Halifax, NS B3L 4P1
(P) 902- 482-2494
(F) 902-482-2501
AHWI@globalserve.net

A non-profit, multi-disciplinary centre of excellence for service, training, and research in health promotion and wellness, and for the prevention of and rehabilitation from cardiac, pulmonary, and other chronic diseases. The Institute's main goal is to help people reach and maintain optimal levels of health, through risk-factor modification and prevention programs. Research on health promotion and wellness, such as Project IMPACT, a study aimed at promoting employee health in Atlantic Canada, is conducted at the Institute.

Atlantic Health Promotion Research Centre
Director: Dr. Renee Lyons
Room 5200, Dentistry Building
Dalhousie University
5981 University Avenue
Halifax, NS B3H 3J5
(P) 902-494-2240
(F) 902-494-3594
E-mail: ahprc@dal.ca
Website: http://www.medicine.dal.ca/ahprc/

The Atlantic Health Promotion Research Centre conducts and facilitates health promotion research that influences policy and contributes to the health and well-being of Atlantic Canadians.
The AHPRC provides assistance with the development of health-related research ideas; offers advice and consultation on proposals and reports; helps with networking; advises on potential funding sources; offers letters of support; and maintains a regular newsletter, a Web site, a library of health promotion materials as well as hosting workshops and seminars on health promotion research.

Atlantic Research Centre
Director: Dr. Harold Cook
Dalhousie University
Room C-302, CRC
5849 University Avenue
Halifax, NS B3H 4H7
(P) 902-494-6491
(F) 902-494-1394
E-mail: arc@dal.ca
Website: http://www.medicine.dal.ca/ricu/arc/

Established in 1967, the Centre conducts basic biomedical research and population studies in the fields of human genetics, cell and signaling, and neurobiology. It also provides education in these fields to undergraduate and graduate students and the general public. Special tests and consultative services for the prevention and treatment of diseases causing metabolic and neurological disorders are provided by the Centre. The Centre's professional staff hold appointments in various departments of the Faculty of Medicine. Its work is supported by agencies such as the Medical Research Council of Canada, the Dalhousie Medical Research Foundation, the governments of the three Maritime Provinces and by private donations.

The Cancer Biology Research Group
Coordinator: David Hoskin, Ph.D.
Department of Microbiology & Immunology
Dalhousie University
Halifax, NS B3H 4H7
(P) 902-494-6509
(F) 902-494-5125
E-mail: dwhoskin@is.cal.ca
Website: http://www.medicine.dal.ca/dimmuno/tumor/

The Cancer Immunotherapy Research Group is a collaborative group of researchers located in close proximity in the Sir Charles Tupper Medical Research Building, Dalhousie University.

The Centre for Clinical Research, QEII Health Sciences Centre
Director: Lisa Underwood
5790 University Avenue, Room 117
Halifax, NS B3H 1V7
(P) 902-473-4069
(F) 902-473-4497
E-mail: resdfh@qe2-hsc.ns.ca
Website: http://www.bionova.ns.ca/directory/html/pqr/queen1.htm

The Centre for Clinical Research administers all research carried out at the QEII and facilitates and coordinates research undertaken throughout the facility. The Centre's principal functions are to act as a resource centre for QEII-based health care research; to create an environment where research in all health care disciplines can flourish and where researchers can fulfill their potential; and to ensure that research at the QEII Health Sciences Centre is conducted according to the highest standards of good clinical practice.

Clinical Trials Research Centre
Manager: Beth Halperin
IWK Grace Health Centre
5850 University Avenue
Halifax, NS B3J 3G9
(P) 902-428-8992
(F) 902-428-3232
E-mail bhalperi@nb.aibn.com

The Clinical Trials Research Center (CTRC), is a research group based in the Department of Pediatrics at Dalhousie University and is affiliated with the IWK Grace Health Centre. The CTRC's personnel of medical research scientists, nurses, technicians, administrative support

staff, and postgraduate and undergraduate trainees, work collectively in various areas related to the conduct of medical research, particularly in the field of infectious diseases, including epidemiological research and clinical trials with drugs and biologics. The CTRC's mission is to characterize the epidemiology of, and assess interventions for, the prevention, control and treatment of infectious diseases in children, adolescents, adults, and their families.

Dalhousie Health Law Institute
Director: Jocelyn Downie
6061 University Avenue
Halifax, NS B3H 4H9
(P) 902-494-6881
(F) 902-494-6879
E-mail: hli@dal.ca
Website: www.dal.ca/law/hli

The Dalhousie Health Law Institute is an interdisciplinary institute of the Faculties of Law, Medicine, Health Professions, and Dentistry. The Institute is committed to the advancement of health law and policy and the improvement of health care practice and delivery in Canada through scholarly analysis, professional education, and public service.

Dalhousie Inflammation Group
Coordinator: Dr. Thomas Issekutz
8E Research
IWK Grace Health Centre
5850 University Avenue
Halifax, NS B3J 3G9
(P) 902-428-8933
(F) 902-428-3217
E-mail: tissekutz@iwkgrace.ns.ca
Website: http://www.dal.ca/~dig/index.html

The Dalhousie Inflammation Group promotes research in inflammatory diseases with an emphasis on interactions between basic science and clinical medicine. Diseases of research focus include arthritis, asthma and lung injury, intestinal inflammation, diabetes and transplantation.

Dalhousie Multiple Sclerosis Research Unit
Contact: Dr. Jock.Murray
5790 University Avenue, Room 114
Halifax, NS B3H 1V7
(P) 902-422-7817
(F) 902-425-1512
E-mail: dmsru@ns.sympatico.ca

Genome Atlantic
President: Dr. Robert Boyd, Institute for Marine Biosciences, National Research Council of Canada
Genome Atlantic
1721 Lower Water Street, Suite 407
Halifax, NS B3J 1S5
(P) 902-421-5645
(F) 902-421-2733
E-mail: info@atlanticgenomecentre.ca
Website: www.genomeatlantic.ca

Genome Atlantic is one of five centers that form Genome Canada, a not-for-profit corporation formed by the Federal Government in February 2000. The mandate of Genome Atlantic is to support large-scale genomics projects that draw on existing Atlantic Canadian strengths and expertise in genomic research.

GPI Atlantic
Director: Dr. Ron Coleman
Box 489, RR#1
Tantallon, NS B0J 3J0
(P) 902-426-5378
(F) 902-426-6348
E-mail:info@gpiatlantic.org
Website: http://www.gpiatlantic.org/

GPI Atlantic is a non-profit research group founded in 1997 to develop an index of sustainable development and well being -- the Genuine Progress Index. Wide interest in the GPI reports to date has led to projects developing genuine progress indicators at the community level and on issues such as women's health, water quality, the cost of tobacco and crime, and the economic value of voluntary work, unpaid housework and child care.

Maritime Centre of Excellence for Women's Health
Director: Dr. Carol Amaratunga
PO Box 3070
Halifax, NS B3J 3G9
(P) 902-420-6723
(F) 902-420-6752
E-mail: MCEWH@dal.ca
Website: www.medicine.dal.ca/mcewh

The Maritime Centre of Excellence for Women's Health is one of five national centres supported by Health Canada's Women's Health Bureau. The Centres have a mandate to conduct research and provide analysis, advice and information to government and health organizations with the primary objective of improving the health status of Canadian women. MCEWH is a dynamic interaction of community, academic, clinical and government representatives in the Atlantic Provinces.

Mental Health Action Research Connection (MHARC)
Coordinator: Debra Ripley
1221 Barrington Street
Halifax, NS B3J 1Y2
(P) 902-473-4798 Ext. 3
(F) 902-473-6259
E-mail: connections@naznet.net

MHARC is a non-profit, community-based organization that represents a collaboration among community-based agencies and mental health consumers. A primary objective of MHARC is to engage in practical and applied projects that represent community-based action research activities linking the quest for knowledge with meaningful products that make a difference in the lives and health of mental health consumers.

Neuroscience Institute
Director: I.A. Meinertzhagen, Dsc
Life Science Centre
Dalhousie University
Halifax, NS B3H 4J1
(P) 902-494-2131
(F) 902-494-6585
E-mail: iam@is.dal.ca
Website: www.neuroscience.dal.ca

The Neuroscience Institute promotes and coordinates research in neuroscience. It serves as an umbrella organization to foster research and training in neuroscience at Dalhousie. A major objective is to increase understanding of the functions of the nervous system in health and disease, and, to this end, the Institute coordinates the activities of neuroscientists in the Faculty of Medicine and the Faculty of Science, facilitating collaboration between clinical and basic scientists in the two faculties. The Institute also provides a vehicle to seek new sources of funding and will encourage new initiatives in all areas of neuroscience research at Dalhousie. In addition, the Institute promotes and coordinates training programs in neuroscience currently offered through constituent departments at both the undergraduate and graduate levels.

Nova Scotia Centre on Aging
Director: Marlene MacLennan
Mount Saint Vincent University
Halifax, NS B3M 2J6
(P) 902-457-6546
(F) 902-457-6508
E-mail: marlene.mac!ellan@msvu.ca

The Nova Scotia Centre on Aging , Mount Saint Vincent University, conducts research in areas related to the quality of life for older adults and their families. Specific research areas include community supports for family caregivers; autonomy for residents in long-term care facilities; community-facility relationships; older parents providing care for adult sons/daughters with lifelong disabilities; everyday technologies and older adults; and evaluation research related to educational materials and assessment instruments. The research shapes, and is shaped by, the continuing education and community outreach initiatives of the Centre.

Nova Scotia Environmental Health Centre
Research Director: Dr. Michel Joffres
PO Box 2130
Fall River, NS B2T 1K6
(P) 902-860-0057
(F) 902-860-2046
Website: www.nsehc.com

The Nova Scotia Environmental Health Centre is committed to research into and treatment of environmental sensitivities.

The Pediatric Pain Research Lab
IWK Grace Health Centre
5850/5980 University Avenue
P.O. Box 3070
Halifax, NS B3H 4H7
(P) 902-428-2702
(F) 902-428-2709
pedpain@is.dal.ca
Website: www.dal.ca/~pedpain

The Pediatric Pain Research Lab is located in the IWK Grace Health Centre and the Psychology Department of Dalhousie University.

Population Health Research Unit
Director: Dr. George Kephart
5849 University Avenue
Halifax, NS B3J 4H7
(P) 902-494-3860
(F) 902-494-1597
George.Kephart@Dal.ca
Website: www.medicine.dal.ca/gorgs/phru

The Population Health Research Unit was established within Dalhousie University's Department of Community Health and Epidemiology in 1993 to meet the growing need for data and research support in population health, health services utilization and their interrelationships.

Psychopharmacology Research Unit
Director: Dr. Serdar Dursun
Department of Psychiatry
Room 3046, QEII Health Sciences Centre
5909 Veterans Memorial Way
Halifax, NS B3H 2E2
(P) 902-473-2533
(F) 902-473-3575
E-mail: sdursun@is.dal.ca

Dalhousie scientists from the departments of Psychiatry, Pharmacology, Neurology, Medicine, Radiology, Psychology and the Institute of Neuroscience have united to explore the art and science of psychopharmacology. The Psychopharmacology Research Unit is doing groundbreaking research into the causes and treatment of mental illness. The research team strives to achieve a comprehensive understanding of how a psychotropic drug works in the body,

its side-effects and its efficacy. In addition to investigating the basic molecular mechanisms that trigger schizophrenia and biochemical changes in the brain that cause depression, the research unit conducts clinical trials.

Retina and Optic Nerve Research Laboratory

Director: Dr. Bal Chauhan
Floor 15 West
Sir Charles Tupper Medical Building
Dalhousie University
5859 University Avenue
Halifax, NS B3H 4H7
(P) 902-494-2710
(F) 902-494-6309
E-mail: balwantray.chauhan@dal.ca
Website: www.dal.ca/~ceron/MainBody.html

The $1.7 million Retina and Optic Nerve Research Laboratory brings ophthalmology researchers together with scientists from other areas of medicine under one roof to achieve a common goal to find new ways of treating and preventing diseases such as glaucoma and retinal ischemia, that often lead to blindness.

Vehicle Safety Research Team

Director: Dr. C.R. Baird
Dalhousie University - Sexton Campus
P. O. Box 1000
Halifax, NS B3J 2X4
(P) 902-494-3290
(F) 902-425-1096
E-mail: sherry.norton@dal.ca

The Vehicle Research Safety Team is one of eight university-based teams located across Canada. The VSRT has special research interests in causal factor evaluation methods, in computer-aided accident reconstruction, in database management and in modular analysis procedures, particularly in relation to injury severity and injury-causal factors. The team is composed of two professional engineers from the Faculty as well as two full-time investigators, one of whom is a professional engineer. In addition, an advisory committee provides liaison and interaction with medical personnel, policing agencies and provincial transportation authorities.

Appendix D
Key Informants

Carol Amaratunga PhD
Executive Director
Maritime Centre of Excellence for Women's Health

Carl Breckenridge PhD
Vice-President Research
Dalhousie University

Harold Cook PhD
Associate Dean, Research & Planning
Faculty of Medicine, Dalhousie University

Howard Dickson PhD
Faculty of Medicine
Dalhousie University

Joan Fraser
Executive Director
Heart and Stoke Foundation of Nova Scotia

Gerald Johnston PhD
Chair, Research Advisory Committee
Cancer Care Nova Scotia

Cynthia Mathieson PhD
Director of Research
Mount Saint Vincent University

Lynn McIntyre MHSC, FRCPC
Dean, Faculty of Health Professions
Dalhousie University

Linda Murphy
Director, Research Programs
Canadian Health Services Research Foundation

Thomas Regan PhD
Dean
Faculty of Arts, Acadia University

John Ruedy MDCM, FRCPC
Vice President of Academic Affairs
Queen Elizabeth II Health Sciences Centre

Brenda Ryan
Chief Information Officer
NS Department of Health

Ingrid Sketris PhD
College of Pharmacy
Faculty of Health Professions
Dalhousie University

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1. Bob Dick, 1998.

2. Canadian Institutes of Health Research, 2000, p 12.

3. F.J Mustard and J. Franck, 1991.

4. Federal Provincial and Territorial Ministers of Health, 1994.

5. Canadian Institutes of Health Research, 2000, p 26.

6. K.R Grant, 1999, p 6.

7. Rx&D, 2000.

8. Canadian Health Services Research Foundation, 1999, and J. Lomas 1997.

9. SSHRC, Society, Culture and the Health of Canadians II Grants Guide, 2000.

Http://www.sshrc.ca/english/programinfo/grants guide/nhrdp.html

10. Definition based on J. Lomas, 2000, p 237.

11. Canadian Institutes of Health Research, 2000, p 26.

12. All grants at the IWK and QE II Health Centres are administered by Dalhousie University and therefore included in this total.

13. Canadian Institutes of Health Research, 2000, p 15.

14. SSHRC, Grants Guide Definitions, 2000.

Http://www.sshrc.ca/english/programinfo/grantsguid e/definitions.htm

15. Ibid.

16. Canadian Institutes of Health Research, 1999, p 22.

17. Canadian Institutes of Health Research, 2000, p 12.

18. British Colombia Health Research Foundation, pamphlet, 1998, p 2.

19. NS Provincial Health Council, 2000, p 36-38.

20. Nova Scotia's Health Goals were adopted in 1992 by the Premier of Nova Scotia, the Minister of Health, and the Chairperson of the Provincial Health Council. The Goals were re-affirmed in 1999.